

Message Text

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SUBJECT: ERDA/SFCP: US-POLISH COOPERATION IN COAL RESEARCH

REF: WARSAW 7463

FOR GREENBERG FROM GOUSE

1. WE HAVE REVIEWED THE PROPOSAL YOU TRANSMITTED TO US
ENTITLED, QUOTE A NEW CONCEPT IN COAL GASIFICATION UTILIZ-
ING MHD EXHAUST GASES AND COAL FUELED MHD POWER PLANTS.
UNQUOTE. IT APPEARS THAT THIS PROPOSAL IS CONSISTENT WITH
OUR BUDGET LANGUAGE WHICH IS REPRODUCED BELOW:

QUOTE IT IS PROPOSED TO ENLARGE AND COMPLETE A LABORATORY
STUDY AT THE GDANSK POLYTECHNIK INSTITUTE FOR THE USE OF
ENERGY EXISTING FROM MHD GENERATORS FOR GASIFICATION OF
COAL IN A TWO-STAGE SYSTEM. THIS SYSTEM IS UNIQUE AND
OFFERS THE POSSIBILITY OF CONVERTING COAL TO A CLEAN FUEL
FOR INDUSTRIAL UTILIZATION. ADDITIONAL TESTING AND EX-
PERIMENTATION WITH THIS PROPOSED STUDY WILL BE UNDERTAKEN
AT THE UNIVERSITY OF DANZIG IN GDANSK AND THE INSTITUTE OF
NUCLEAR RESEARCH AT SWIERK. THE COMPLETION OF THIS EN-
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LARGED STUDY WILL REQUIRE A MINIMUM OF THREE YEARS. UNQUOTE

2. WE WOULD LIKE FOR YOU TO TRANSMIT THIS INFORMATION TO THE APPROPRIATE PARTIES IN POLAND PRIOR TO OUR VISIT, ALONG WITH THE FOLLOWING:

CONSIDERABLE PROGRESS HAS BEEN MADE IN THE MHD PROGRAM, BOTH DOMESTICALLY AND ELSEWHERE IN THE WORLD. AS A RESULT, SOME OF OUR PRIORITIES AS TO WHAT IS IMPORTANT ARE MOST SIGNIFICANT HAVE CHANGED SINCE THESE ORIGINAL IDEAS WERE DISCUSSED WITH REPRESENTATIVES OF POLAND. OUR TECHNICAL PEOPLE HAVE REVIEWED THE POLISH PROPOSAL, QUOTE A NEW CONCEPT IN COAL GASIFICATION UTILIZING MHD EXHAUST GASES AND COAL FUELED MHD POWER PLANTS, UNQUOTE AND WE BELIEVE IT FORMS AN ADEQUATE BASIS FOR DISCUSSIONS AT THE NEGOTIATIONS PLANNED TO TAKE PLACE DURING THE WEEK OF FEBRUARY 8, 1976.

HOWEVER, IT MAY BE TO THE BENEFIT OF BOTH PARTIES TO REVISE IT SOMEWHAT. WE NOW BELIEVE THAT ANOTHER APPROACH TO MHD POWER CONVERSION BASED ON COAL MAY BE MORE ATTRACTIVE. THE POLISH PROPOSAL STATES THAT A CLEAN FUELED MHD POWER SYSTEM WILL BE AVAILABLE IN THE US AND THE USSR IN THE NEXT FIVE YEARS. THE FACTS ARE THAT CLEAN FUEL SYSTEMS ARE NOT NOW THE MAJOR THRUST OF THE US MHD PROGRAM. THE SOVIETS HAVE INDICATED TO US THAT THEIR FOCUS WILL CHANGE TO DIRTY SYSTEMS IN THE NEXT FIVE YEARS. IN ADDITION, THE POLISH PROPOSAL DOES NOT RECOGNIZE ALL THE WORK THAT HAS BEEN DONE AND IS CURRENTLY UNDERWAY IN COAL GASIFICATION. THEN, PERHAPS, IT DOES NOT RECOGNIZE THE ABILITY OF MHD SYSTEMS TO OPERATE ON DIRTY COAL GAS WHICH COULD BE ECONOMICALLY MUCH MORE ATTRACTIVE. GASIFIED COAL FOR MHD USE MAY CONTAIN SULFUR IN AMOUNTS EQUIVALENT TO THAT ORIGINALLY CONTAINED IN THE COAL FEEDSTOCKS AS WELL AS VARYING AMOUNTS OF ASH. THEREFORE, IT DOES NOT IMPLY THE DEGREE OF CLEANLINESS REQUIRED FOR OTHER USES SUCH AS FOR GAS TURBINE FIRING.

IN ADDITION, A FUEL FOR AN MHD GENERATOR MUST HAVE LOW HYDROGEN TO CARBON RATIOS TO PREVENT THE FORMATION OF TEMPERATURE DEPRESSING WATER AND FORMATION OF THE ELECTRON
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ZINC RADICAL, OH. THE PROCESS OF COAL COMBUSTION FOR MHD PURPOSES IS NOT THE SAME AS THE PROCESS WHICH IS USUALLY CONSIDERED FOR PRODUCTION OF FUEL GAS FROM COAL. RATHER, GENERALLY MORE CONCERNED WITH THE PRODUCTION OF A SUITABLE MHD PLASMA BY SOME FORM OF STAGED HIGH TEMPERATURE, HIGH PRESSURE COMBUSTION. PROCESSES WE HAVE IN MIND USUALLY REQUIRE THE USE OF PRE-HEATED AIR TO PRODUCE A PLASMA APPROXIMATELY 28000 KELVIN AND PRESSURES OF THE

ORDER OF 10 ATMOSPHERES IN ORDER TO PROVIDE AN ELECTRICALLY CONDUCTING PLASMA AND ALKALI SALT SUCH AS POTASSIUM

CARBONATE IS ADDED TO THE COMBUSTION EFFLUENT PRIOR TO ENTRY TO THE MHD CHANNEL IN ORDER TO MAXIMIZE THE CONDUCTIVITY. THE AIR USED IN THE PROCESS IS GENERALLY BETWEEN 95 AND 100 STOECHIOMETRIC, THEREBY MAXIMIZING HEAT RELEASE AND MINIMIZING THE ASSOCIATION OF CARBON DIOXIDE.

IN SUMMARY, WHILE WE FEEL THE POLISH PROPOSAL IS AN ADEQUATE BASIS FOR PROCEEDING, WE WOULD LIKE TO CONSIDER WITH THEM THE POSSIBILITY OF CONSIDERING THE MORE RECENT THRUST THAT APPEAR ATTRACTIVE IN THE US MHD PROGRAM BY ADDRESSING DIRTY COAL GASIFICATION PROCESSES. ROBINSON

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